IN THE CLAIMS

The enclosed list of claims is a list of all pending claims including claims that have not been amended by way of the present amendment.

1. (currently amended) An apparatus, comprising:
   a) an output packet organizer having a first location and a plurality of second locations, said first and second locations corresponding to the priority of a packet, said first location having higher priority than said second locations, said output packet organizer having a third location, said third location having a higher priority than said first location;
   b) said first and third locations coupled to a scheduler that serves said first and third locations; and,
   c) said second locations coupled to said scheduler through a round robin pointer.

2. (currently amended) The apparatus of claim 1 further comprising ~~a third location, said third location having a higher priority than said first location~~ a pointer that points to a next one of said second locations for each of said scheduler's scheduling cycles.

3. (original) The apparatus of claim 1 further comprising a fourth location, said fourth location having a lower priority than said second location.

4. (original) The apparatus of claim 1 further comprising a packet buffer coupled to said scheduler.

5. (original) The apparatus of claim 1 further comprising a packet pipeline coupled to said first and second locations.

6. (currently amended) A method, comprising:

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a) serving packet identifiers from a first location, said first location having a first priority~~;~~, and

~~b)~~ serving packet identifiers from a first of a group of second locations, said first of a group of second locations indicated by a round robin pointer, said groups of second locations having a second priority, said first priority higher than said second priority;

~~c)~~ b) incrementing said round robin pointer; and,

~~d)~~ c) serving packet identifiers from said first location~~;~~ and

~~e)~~ serving packet identifiers from a second of a group of second locations, said second of a group of second locations indicated by said round robin pointer~~.~~; and

d) consuming a percentage of the servicing for a third of said group of second locations with additional servicing of said first location because said first location has been serviced for more than its allocated share of packet identifiers.

7. (currently amended) The method of claim 6 further comprising configuring said first location for a first percentage of ~~said~~ a scheduler's resources.

8. (currently amended) The method of claim 6 further comprising configuring a plurality of second locations for a percentage of ~~said~~ a scheduler's resources.

9. (currently amended) The method of claim 6 ~~further comprising consuming a percentage of said first second location's servicing with packet identifiers from said first location if said first location has packet identifiers that exceed said first location's configured for percentage of said scheduler's resources~~ wherein said pointer is a round robin pointer that circularly points to each location of said group of said second locations.

10. (currently amended) The method of claim 6 further comprising moving packet identifiers ~~within said first second location into said second second~~

~~location if said first second location is not fully served by said scheduler~~ not serviced by said third of said group of second locations, as a consequence of said consuming, into a fourth of said group of second locations.

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~~11~~. (currently amended) An output packet organizer, comprising:

a) a first location ~~that stores~~to store at least one high priority packet identifier, said high priority packet identifier indicating where a high priority packet~~, that~~ is waiting ~~to be sent from a packet buffer to a networking line, is located~~ within ~~said~~ a packet buffer;

b) n time slot locations wherein n is an integer, ~~wherein~~ each of said n time slot locations ~~stores~~ to store one or more of its own low priority packet identifiers ~~such that one of n low priority packet identifiers can be stored per said time slot location~~, each of said ~~n~~ low priority packet identifiers indicating where a corresponding low priority packet is ~~located~~ waiting within said packet buffer ~~such than n low priority packets waiting to be sent from said packet buffer to said networking line are indicated~~, said high priority packet having a higher priority than each of said ~~n~~ low priority packets; and

c) a scheduler ~~that services~~ to service said locations according to a plurality of scheduling cycles, wherein said first location and one of said n time slot locations ~~can~~ is to be serviced for each of said scheduling cycles~~, such that, n of said scheduling cycles results in~~ so as to cause, in n scheduling cycles, said first location being serviced n times and said n time slot locations each being serviced one time, said servicing of a said location causing removal of a said packet identifier stored therein, said removal of a said packet identifier stored therein causing sending of a packet identified by said packet identifier from said packet buffer ~~to said networking line~~, wherein each

of said scheduling cycles corresponds to an output rate defined by an amount of packet data sent from said packet buffer per unit of time.

12. (currently amended) The output packet organizer of claim 11 wherein said scheduler is to services said n time slot locations in a round robin fashion.

13. (previously added) The output packet organizer of claim 11 wherein said high priority packet is a packet that carries real time traffic.

14. (previously added) The output packet organizer of claim 13 wherein said real time traffic further comprises voice traffic.

15. (currently amended) The output packet organizer of claim 11 wherein at least one of said n low priority packets is a packet that carries data traffic.

16. (previously added) The output packet organizer of claim 15 wherein said data traffic further comprises an e-mail message.

17. (currently amended) The output packet organizer of claim 11 further comprising a second location ~~that~~ to stores a higher priority packet identifier, said higher priority packet identifier indicating where a higher priority packet, that is waiting to be sent from said packet buffer ~~to said networking line~~, is located within said packet buffer, said higher priority packet having a higher priority than said high priority packet, and wherein said second location can be serviced by said scheduler for each of said scheduling cycles.

18. (previously added) The output packet organizer of claim 17 wherein said higher priority packet carries network maintenance traffic.

19. (previously added) The output packet organizer of claim 11 wherein said scheduler services a said location only if said location is storing a said packet identifier.

20. (currently amended) The output packet organizer of claim 19 further comprising a second location ~~that~~ to stores a lower priority packet identifier, said lower priority packet identifier indicating where a lower priority packet, that is waiting to be sent from said packet buffer ~~to said networking line~~, is located within said packet buffer, said lower priority packet having a lower priority than said n low priority packets, and wherein said second location can be serviced by said scheduler only if a said location other than said second location is empty when said scheduler looks to service said other location.

21. (currently amended) The output packet organizer of claim 11 wherein said scheduler ~~can be configured to~~ is capable of servicing one or more ~~service~~ high priority packet identifiers from said first location, per a said scheduling cycle, such that a first percentage of said amount of packet data can be removed from said packet buffer, in the form of one or more high priority packets, per said scheduling cycle.

22. (currently amended) The output packet organizer of claim 21 wherein said scheduler ~~can be configured to service~~ is capable of servicing low priority packet identifiers from one of said n time slot locations, per said scheduling cycle, such that a second percentage of said amount of packet data can be removed from said packet buffer, in the form of low priority packets, per said scheduling cycle.

23. (currently amended) The output packet organizer of claim 22 wherein said scheduler~~, during said scheduling cycle, services~~ is capable of servicing high priority packet identifiers from said first location during said scheduling cycle, to the extent they represent an amount of high priority packet data

greater than said first percentage, at the expense of low priority packet identifiers stored within the time slot location scheduled to be serviced for said scheduling cycle.

24. (currently amended) The output packet organizer of claim 23 wherein a next time slot location ~~accepts~~ is capable of accepting said low priority packet identifiers that were left un-serviced as a result of said servicing of said high priority packet identifiers that represented high priority packet data beyond said first percentage, and where said next time slot location will be serviced by said scheduler during a next scheduling cycle that follows said scheduling cycle.

25. (currently amended) The output packet organizer of claim 11 wherein a weighted fair queue is capable of being built into said n elastic time slots by establishing a first quantitative flow having a higher output rate than a second quantitative flow, such that, low priority packets assigned to said first quantitative flow endure less waiting time within said packet buffer than low priority packets assigned to said second quantitative flow.

26. (currently amended) The output packet organizer of claim 11 wherein a first plurality of different users are capable of being assigned to said first quantitative flow and a second plurality of different users are assigned to said second quantitative flow.

27. (currently amended) A method, comprising:

servicing a first location and n time slot locations according to a plurality of scheduling cycles, wherein said first location and one of said n time slot locations are serviced for each of said scheduling cycles~~, such that, n of said scheduling cycles results in~~ so as to cause, in n scheduling cycles, said first location being serviced n times and said n time slot locations each being serviced one time, said servicing

of any of said locations causing removal of a packet identifier stored therein, said removal of a packet identifier stored therein causing sending of a packet identified by said packet identifier from a packet buffer ~~to a networking line~~, wherein each of said scheduling cycles corresponds to an output rate defined by an amount of packet data sent from said packet buffer per unit of time, said first location used to store ~~high priority~~ packet identifiers of a first priority, said n time slot locations used to store ~~low priority~~ packet identifiers of a second priority, said first priority higher than said second priority~~, such that high priority packets identified by said high priority packet identifiers have a higher priority than low priority packets identified by said low priority packet identifiers~~.

28. (previously added) The method of claim 27 wherein said n time slot locations are serviced in a round robin fashion.

29. (currently amended) The method of claim 27 wherein at least one of said ~~high~~ first priority packet identifiers identifies where a packet that carries real time traffic is found within said buffer memory.

30. (previously added) The method of claim 29 wherein said real time traffic further comprises voice traffic.

31. (currently amended) The method of claim 27 wherein at least of said ~~low~~ second priority packet identifiers identifies where a packet that carries data traffic is found within said buffer memory.

32. (previously added) The method of claim 31 wherein said data traffic further comprises an e-mail message.

33. (currently amended) The method of claim 27 further comprising servicing a second location according to said plurality of scheduling cycles, said second location used to store a higher priority packet identifier than a first priority packet identifier, said higher priority packet identifier indicating where a ~~higher priority~~ packet, whose priority is higher than a packet identified by a said first priority packet identifier, ~~that~~ is waiting within said packet buffer to be sent from said packet buffer ~~to a networking line, is located within said packet buffer, said higher priority packet having a higher priority than said high priority packets~~.

34. (previously added) The method of claim 33 wherein said higher priority packet carries network maintenance traffic.

35. (previously added) The method of claim 27 wherein said locations are serviced only if a said location is storing a said packet identifier.

36. (currently amended) The method of claim 27 further comprising servicing a second location according to said plurality of scheduling cycles, said second location used to store a lower priority packet identifier than said second priority packet identifier, said lower priority packet identifier indicating where a ~~lower priority~~ packet, whose priority is lower than a packet identified by a said second priority packet identifier, ~~that~~ is waiting within said packet buffer to be sent from said packet buffer ~~to a networking line, is located within said packet buffer, said lower priority packet having a lower priority than said low priority packets~~, and said second location is said serviced only if a said location other than said second location is empty when its turn to be serviced arises during a said scheduling cycle.

37. (currently amended) The method of claim 27 wherein one or more of said ~~high~~ first priority packet identifiers are serviced from said first location, per a said scheduling cycle, such that a first percentage of said amount of packet

data is removed from said packet buffer, in the form of ~~high~~ first priority packets, per said scheduling cycle.

38. (currently amended) The method of claim 37 wherein said ~~low~~ second priority packet identifiers are serviced from one of said n time slot locations, per said scheduling cycle, such that a second percentage of said amount of packet data is removed from said packet buffer, in the form of ~~low~~ second priority packets, per said scheduling cycle.

39. (currently amended) The method of claim 38 wherein ~~high~~ first priority packet identifiers are serviced from said first location, to the extent they represent an amount of ~~high~~ first priority packet data greater than said first percentage, at the expense of ~~low~~ second priority packet identifiers stored within the time slot location scheduled to be serviced for said scheduling cycle.

40. (currently amended) The method of claim 39 wherein a next time slot location accepts said ~~low~~ second priority packet identifiers that were left un-serviced as a result of said servicing of said ~~high~~ first priority packet identifiers that represented ~~high~~ first priority packet data beyond said first percentage, said next time slot location serviced during a next scheduling cycle that follows said scheduling cycle.

41. (currently amended) The method of claim 27 wherein a weighted fair queue is built into said n ~~elastic~~ time slots by establishing a first quantitative flow having a higher output rate than a second quantitative flow, such that, ~~low~~ second priority packets assigned to said first quantitative flow endure less waiting time within said packet buffer than ~~low~~ second priority packets assigned to said second quantitative flow.

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42. (previously added) The output packet organizer of claim 41 wherein a first plurality of different users are assigned to said first quantitative flow and a second plurality of different users are assigned to said second quantitative flow.

43. (new) An apparatus, comprising:

a) a packet buffer capable of storing:

1) packets of a first priority;

2) packets of a lower priority than said first priority, said lower priority packets suited to withstanding longer wait times in said packet buffer than said first priority packets; and,

b) an output packet organizer coupled to said packet buffer, said output packet organizer to organize and release packet identifiers that point to said packets, where, a said release of a packet identifier from said output packet organizer triggers said packet identifier's corresponding packet to be sent from said packet buffer toward an outbound networking line, said output packet organizer comprising:

1) a first location to store first priority packet identifiers that each point to a different one of said first priority packets, said first location coupled to a scheduler so as to be capable of releasing a first priority packet identifier for each of n scheduling cycles;

2) n or more of time slot locations to store packet identifiers that point to said lower priority packets, and, a pointer that points to a next time slot location for each of said n scheduling cycles so as to be capable of releasing a low priority packet identifier from a different one of said n time slot locations for each of said n scheduling cycles.

44. (new) The apparatus of claim 43 wherein said packet buffer is also capable of storing packets having a priority higher than said first priority.

45. (new) The apparatus of claim 44 wherein said packets that are higher priority than said first priority are network maintenance/control packets.

46. (new) The apparatus of claim 43 wherein said output packet organizer further comprises a second location to store higher than first priority packet identifiers that each point to a different one of said higher than first priority packets, said second location coupled to said scheduler so as to be capable of releasing a higher than first priority packet identifier for each of n scheduling cycles.

47. (new) The apparatus of claim 43 wherein said first priority packets are real time packets.

48. (new) The apparatus of claim 43 wherein said lower priority packets are neither real time packets nor network maintenance/control packets.

49. (new) The apparatus of claim 43 wherein said scheduling cycles are organized into an amount of packet data sent from said packet buffer per unit of time, and where said first location and said scheduler are capable of effectively causing a first percentage worth of said amount of packet data of said high priority packets to be sent from said packet buffer for each of said n scheduling cycles.

50. (new) The apparatus of claim 49 wherein said group of n or more time slot locations and said pointer are capable of effectively causing a second percentage worth of said amount of packet data of said low

priority packets to be sent from said packet buffer for each of said n scheduling cycles.

51. (new) The apparatus of claim 50 wherein, low priority packet identifiers whose locations are pointed to during a scheduling cycle are not released if and to the extent packet identifiers having higher priority than said low priority packet identifiers exceed their allotted percentage.

52. (new) The apparatus of claim 51 wherein said not released low priority packet identifiers are released on an immediately following scheduling cycle after said scheduling cycle.

53. (new) The apparatus of claim 52 wherein said pointer is a round robin pointer.

54. (new) The apparatus of claim 43 wherein a weighted fair queue is capable of being built into said time slot locations by establishing a first quantitative flow having a higher output rate than a second quantitative flow, such that, low priority packets assigned to said first quantitative flow endure less waiting time within said packet buffer than low priority packets assigned to said second quantitative flow.

55. (new) The output packet organizer of claim 54 wherein a first plurality of different users are capable of being assigned to said first quantitative flow and a second plurality of different users are capable of being assigned to said second quantitative flow.

56. (new) The apparatus of claim 43 wherein said output packet organizer is coupled to a pipeline stage of a packet processing pipeline, said pipeline stage to at least store each of said low priority packet identifiers into a said time slot location that corresponds to an appropriate

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delay for its corresponding low priority packet, each of said delays calculated within said pipeline, where, said pipeline stage is to recognize which time slot location corresponds to said appropriate delay based upon a data structure that reflects the state of said output packet organizer and that is passed from said output packet organizer to said pipeline stage for each of said low priority packets.

57. (new) The apparatus of claim 56 wherein said pipeline further comprises the following pipeline stages for regulating traffic offered by a network to a first user of said network and a second user of said network, wherein, the following pipeline stages precede said pipeline stage in said pipeline:

a) a first pipeline stage comprising:

1) a first data bus to receive from a first memory:

(i) during a first pipeline cycle:

a first output flow identifier;

(ii) during a second pipeline cycle:

a second output flow identifier; and

b) a second pipeline stage that follows said first pipeline stage, said second pipeline stage comprising:

1) a second data bus to receive from a second memory:

(i) during said second pipeline cycle and from a location of said second memory pointed to by said first output flow identifier:

a first TOS parameter for a first of said low priority packets, said first low priority output packet destined for said first user;

(ii) during a third pipeline cycle and from a location of said second memory pointed to by said second output flow identifier:

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a second TOS parameter for a second of said low priority packets, said second low priority packet destined for said second user;

2) register space in which to store:

(iii) during said second pipeline cycle:

a first parameter from which a first of said delays can be calculated, said first delay for a first of said low priority packets, said first delay consistent with said first output flow;

(iv) during said third pipeline cycle:

a second parameter from which a second of said delays can be calculated, said second delay for a second of said low priority packets, said second delay consistent with said first output flow;

3) logic circuitry to calculate:

(v) during said second pipeline cycle:

said first delay;

(vi) during said third pipeline cycle;

said second delay.